

**WE CLAIM:**

1. A method of processing a request for a connection through a multi-service gateway, comprising:

5 allocating resources from a resource pool as a function of: a usage level of the pool, a priority level of the connection request and a pool occupancy threshold.

10 2. A method as claimed in claim 1, wherein allocating resources from the resource pool comprises:

determining the usage level of the resource pool; and

15 if the usage level is below the pool occupancy threshold, allocating resources from the resource pool to satisfy the connection request;

if the usage level is not below the occupancy threshold, allocating resources from the pool to satisfy the connection request only if the priority level of the connection request is higher than a pre-determined level.

20 3. A method as claimed in claim 2, further comprising receiving the connection request prior to allocating resources from the resource pool.

25 4. A method as claimed in claim 2, further comprising receiving the connection request from a connection server/broker prior to allocating resources from the resource pool.

30 5. A method as claimed in claim 2, further comprising determining the priority level of the connection request.

6. A method as claimed in claim 5, wherein the priority level of a connection request is a function of the type of traffic carried by the requested connection.

7. A method as claimed in claim 5, wherein the pool occupancy threshold is a function of the priority level of the connection request.

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8. A method as claimed in claim 6, wherein the pool occupancy threshold is a function of the priority level of the connection request.

10 9. A method as claimed in claim 6, wherein each connection request is associated a type of traffic selected from the group consisting of originating, terminating, feature and progress.

15 10. A method as claimed in claim 9, wherein the priority level of progress traffic is greater than the priority level of feature traffic, which is greater than the priority level of terminating traffic, which is greater than the priority level of originating traffic.

20 11. A method as claimed in claim 1, wherein the resources are software resources for processing packets.

25 12. A method as claimed in claim 1, wherein the resources are port processing resources.

13. A method as claimed in claim 1, wherein the resources are adapted to perform conversion of a signal from a circuit-switched format to a packet-switched format.

30 14. A method as claimed in claim 13, wherein the circuit-switched format is a time-division-multiplexed (TDM) format.

15. A method as claimed in claim 13, wherein the packet-switched format is an asynchronous transfer mode (ATM) format or an Internet Protocol (IP) format.

5 16. A method as claimed in claim 1, further comprising:  
if no resources are allocated to satisfy the connection request, blocking the connection request.

10 17. A method as claimed in claim 15, further comprising reporting blockage of the connection request to a connection server/broker.

15 18. A method as claimed in claim 1, further comprising:  
determining whether circuit-switched connection resources are required to satisfy the connection request; and  
if circuit-switched connection resources are required to satisfy the connection request, setting a cross-connect mapping for controlling the circuit-switched connection resources.

20 19. A method as claimed in claim 1, further comprising selecting the pool occupancy threshold to achieve a probability of blocking that is less than a pre-determined value.

25 20. A multi-service gateway, comprising:  
a plurality of packet-switched ports;  
a pool of port processing software entities (PPSEs), each PPSE having sufficient capacity to provide processing  
30 for any of the packet-switched ports; and  
a resource manager adapted to execute a method comprising receiving connection requests and, if a particular connection request involves at least one of the packet-switched ports, allocating a subset of the PPSEs in the pool

for satisfying the particular connection request, as a function of a priority level of the particular connection request, as a function of a usage level of the pool and as a function of a pool occupancy threshold.

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21. A multi-service gateway as claimed in claim 20, wherein allocating comprises:

determining the usage level of the pool; and

10 if the usage level is below the pool occupancy threshold, allocating resources from the resource pool to satisfy the connection request;

15 if the usage level is not below the occupancy threshold, allocating resources from the pool to satisfy the connection request only if the priority level of the connection request is higher than a pre-determined level.

20 22. A multi-service gateway as claimed in claim 21, wherein the resource manager is adapted to determine the priority level of the connection request.

25 23. A multi-service gateway as claimed in claim 20, wherein each PPSE has the capability to perform conversion of a signal from a circuit-switched format to a packet-switched format.

24. A multi-service gateway as claimed in claim 23, wherein the circuit-switched format is a time-division-multiplexed (TDM) format.

30 25. A multi-service gateway as claimed in claim 23, wherein the packet-switched format is an asynchronous transfer mode (ATM) format or an Internet Protocol (IP) format.

26. A multi-service gateway as claimed in claim 20, wherein the resource manager is further adapted to block the connection request if no resources are allocated to satisfy the connection request.

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27. A multi-service gateway as claimed in claim 26, wherein the resource manager is further adapted to report blockage of the connection request to a connection server/broker.

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28. A multi-service gateway as claimed in claim 20, further comprising a plurality of circuit-switched ports and a set of circuit-switched connection resources, wherein the resource manager is further adapted to determine whether circuit-switched connection resources are required to satisfy the connection request and, if circuit-switched connection resources are required to satisfy the connection request, setting a cross-connect mapping for controlling the circuit-switched connection resources.

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29. A multi-service gateway, comprising:

means for receiving a connection request;

means for determining a usage level of resources in a resource pool in the multi-service gateway; and

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means for allocating resources from the resource pool to satisfy the connection request if the usage level of the pool is below an occupancy threshold, otherwise determining a priority level of the connection request and allocating resources from the pool to satisfy the connection request only if the priority level of the connection request is higher than a pre-determined level.

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30. Computer-readable media tangibly embodying a program of instructions executable by a resource manager to perform a

method of processing a received request for a connection through a multi-service gateway, the method comprising:

determining a usage level of resources in a resource pool in the multi-service gateway; and

- 5 allocating resources from the resource pool to satisfy the connection request if the usage level of the pool is below an occupancy threshold, otherwise determining a priority level of the connection request and allocating resources from the pool to satisfy the connection request  
10 only if the priority level of the connection request is higher than a pre-determined level.

31. At least one computer programmed to execute a process for processing a received request for a connection through a  
15 multi-service gateway, the process comprising:

determining the usage level of a resource pool in the multi-service gateway; and

- if the usage level is below the pool occupancy threshold, allocating resources from the resource pool to  
20 satisfy the connection request;

if the usage level is not below the occupancy threshold, allocating resources from the pool to satisfy the connection request only if the priority level of the connection request is higher than a pre-determined level.